EX-Logic

This article provides a general overview to the Biamp EX-Logic GPIO hardware.

The EX-Logic provides 16 configurable GPIO pins: 12 connections that can be programmed in Tesira software to work as either logic inputs or outputs plus 4 connections that can work either as logic input or output connections or variable voltage control inputs.

On the back panel of the EX-Logic, there are four connector blocks: three of these are 5-pin logic IO connectors (four logic pins and a ground pin), while the fourth is a 6-pin logic / voltage control connector (+5 volt pin, 4 logic/voltage control pins and a ground pin).

The EX-Logic is a standard PoE ethernet device and does not require the use of an AVB switch.

Logic I/O

Pins 1-16 are user configurable as either logic input or output connections via Tesira software.

Logic inputs

A logic input can provide control of system actions like recalling presets, muting channels, ducking signals, combining rooms, etc by means of an external contact closure or 5V TTL logic. By default the voltage on these pins is high causing a 1 on the input. A contact closure grounds the voltage causing a 0 on the input.

Logic outputs

A logic output can be used to provide indication such as microphone activity or control external devices by using relays such as speaker level control.

Logic outputs are “open collector” with an internal pull-up. This means that when not active, they will measure 5V but will not provide current. Upon activation (from a logic signal within the Tesira program), the logic output goes low, allowing current flow.

Connecting LEDs

When configured as a logic output, each of the 1-16 Logic IO pins can be configured as a current source to drive an LED directly (5V / 10mA maximum per output). When using EX-Logic as a power source, the corresponding Logic Output blocks in your Tesira configuration must be created with the “Enable Powered Outputs” option selected.
GPIO pins 1-12 can be configured as simple contact closure outputs capable of sinking up to 300mA at 40V. In this mode, an external power supply is required (e.g. to drive a high brightness LED or multiple LED’s). Please note: When LED’s are wired to the EX-Logic using this method, the “Enable Powered Outputs” should remain unchecked in the Logic Output Initialization window in Tesira to avoid damaging the EX-Logic.

Note that if external power supplies of greater than 4V are utilized for LEDs (or other hardware), logic pins 13-16 will require the use of an external relay. Logic outputs 13-16 support analog voltage control and are connected to analog-digital converters. To protect the analog-digital converter from over-voltage, there is a 40K Ohm resistor that diverts voltage over roughly 4V to the internal 3.3V rail.

If a relay is not used in conjunction with an external power supply on pins 13-16 an LED may remain in an on state, as the "leakage" current flowing through the resistor may be enough to partially power the LED. The exact voltage and current available to the LEDs will depend upon the external power supply and current-limiting resistors being utilized, and the intensity of the "leakage" on state is dependent on the LED efficiency.

Voltage Control / Potentiometer

On the back panel of the EX-Logic, the right-most connector block has a +5 volt pin, 4 logic/voltage control pins, and a ground pin. It is labeled "Logic / VC I/O" to denote that it has unique properties.

GPIO logic pins 13-16 are connected to analog-digital converters and are configurable to operate as variable voltage control connections. They can accept a variable input voltage (such as a potentiometer for volume control) up to 5V, this voltage can be sourced from the +5V pin (next to pin 13). The TesiraFORTÉ, Server, and Server-IO’s analog GPIO inputs can be calibrated to the resistance range of a potentiometer that is connected to it via Tesira software. Potentiometers connected to GPIO ports 13-16 of the TesiraFORTÉ, Server, or Server-IO can be programmed in the software to control various system levels.

TesiraFORTÉ, Server, and Server-IO GPIO note

Behavior of the GPIO pins on the TesiraFORTÉ, Server, and Server-IO are the same as those of the EX-Logic pins 13-16.

Further reading

Refer to the Tesira software Help file topic "Ex-Logic Wiring" for additional internal circuit schematics.

- EX-LOGIC programming
- Wiring LED’s and relays to the EX-LOGIC
• Wiring switches to the EX-LOGIC
• Wiring potentiometers to the EX-LOGIC